Title

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Journal

Journal of General Internal Medicine, 41(9)

ISSN

0884-8734

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Publication Date

2026-07-01

DOI

10.1007/s11606-026-10243-7

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KEY WORDS: chronic pain; buprenorphine; opioids; opioid epidemic; medicaid; prior authorization

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INTRODUCTION

Buprenorphine, a partial opioid agonist, has equivalent analgesic properties compared to full-agonist opioids such as morphine and milder undesirable side effects, notably respiratory depression.[1] Buprenorphine use reduces full-agonist opioid prescription rates and daily amounts used and may thus be appealing in the US opioid epidemic context.[2] Two buprenorphine formulations are FDA-approved for chronic pain (a transdermal patch and a buccal film). The Veterans' Health Administration (VHA) suggests using buprenorphine instead of full-agonist opioids for chronic pain patients on opioids.[3] Hurdles to such a transition include a lack of provider training and, beyond the VHA, insurance coverage. Medicaid covers more Americans than any other public program, and chronic pain disproportionately affects low-income populations.[4] Medicaid prior authorization (PA) requirements and preferred drug list (PDL) exclusion restrict access to buprenorphine for opioid use disorder (OUD).[5] This may also be true for buprenorphine used for chronic pain. We hypothesized that the uptake of buprenorphine formulations that are FDA-approved for pain may have been slower in states with higher insurance-related barriers and sought to describe trends in transdermal and buccal buprenorphine prescriptions among Medicaid enrollees, by PA and PDL status.

METHODS

We conducted a retrospective cross-sectional analysis of 2015–2024 state Medicaid quarterly buprenorphine prescriptions using publicly available state Medicaid drug utilization files[6] and Medicaid enrollment data from the Kaiser Family Foundation's State Health Facts.[7] We reviewed Medicaid agencies' websites for transdermal and buccal buprenorphine PDL and PA information in August 2025 and classified states as low, moderate, or high-barrier-to-use based on whether they included at least one formulation in their PDL without PA requirements, required a PA or lacked PDL inclusion for both, or required PA *and* excluded both formulations from their PDL. Because the dosing ranges for these formulations are much lower than those approved for OUD, we assumed they were prescribed for pain. Our primary outcome was the quarterly number of prescriptions per 100,000 enrollees. Our independent variables were quarter-year, PDL, PA requirement status, and state fixed effects to account for time-invariant state characteristics. To determine the association between our independent variables and quarterly prescriptions, we fit linear regressions using robust standard errors in Stata 19, defining statistical significance as $P < 0.05$. This study was exempt from IRB review.

RESULTS

We reviewed PA and PDL information for 51 jurisdictions (50 states and DC). Fewer PDLs included buccal (vs transdermal) buprenorphine [(23.5%, n = 12 vs 78.4%, n = 40). A plurality of states (47.0%, n = 24) did not require a PA for transdermal buprenorphine compared to 9.8% (n = 5) for buccal buprenorphine (Fig. 1). Most states were classified as moderate barrier-to-use (n = 33, 64.7%); 1 in 6 were low barrier (n = 8, 15.7%), and 1 in 5 were high-barrier (n = 10, 19.6%). The median (IQR) number of prescriptions per 100,000 enrollees throughout the study period was 9.9 (0–37.3) for transdermal and 8.5 (0–19.4) for buccal buprenorphine.

Stratifying by barrier level, transdermal buprenorphine prescriptions increased only among low-barrier states (β =0.72 prescriptions/100,000 enrollees per quarter, 95% CI 0.3–1.14, P = 0.001), while buccal film prescriptions increased across all three groups (Fig. 2). Adjusting for quarter-years and state fixed-effects, PDL inclusion was associated with 13.5 more buccal film prescriptions/100,000 enrollees each quarter (95% CI 9.4–17.6, $P < 0.001$). PA requirements were associated with 9.5 fewer buccal film prescriptions/100,000 enrollees (95% CI 6.0–13.0, $P < 0.001$). For transdermal buprenorphine, adjusting for quarter-years and state fixed effects, PA requirements were not associated with prescription rates, while PDL inclusion was associated with 12.6 more prescriptions/100,000 enrollees each quarter (95% CI 4.5–20.7, P = 0.002).

Received August 26, 2025
Accepted January 26, 2026
Published online: 17 February 2026

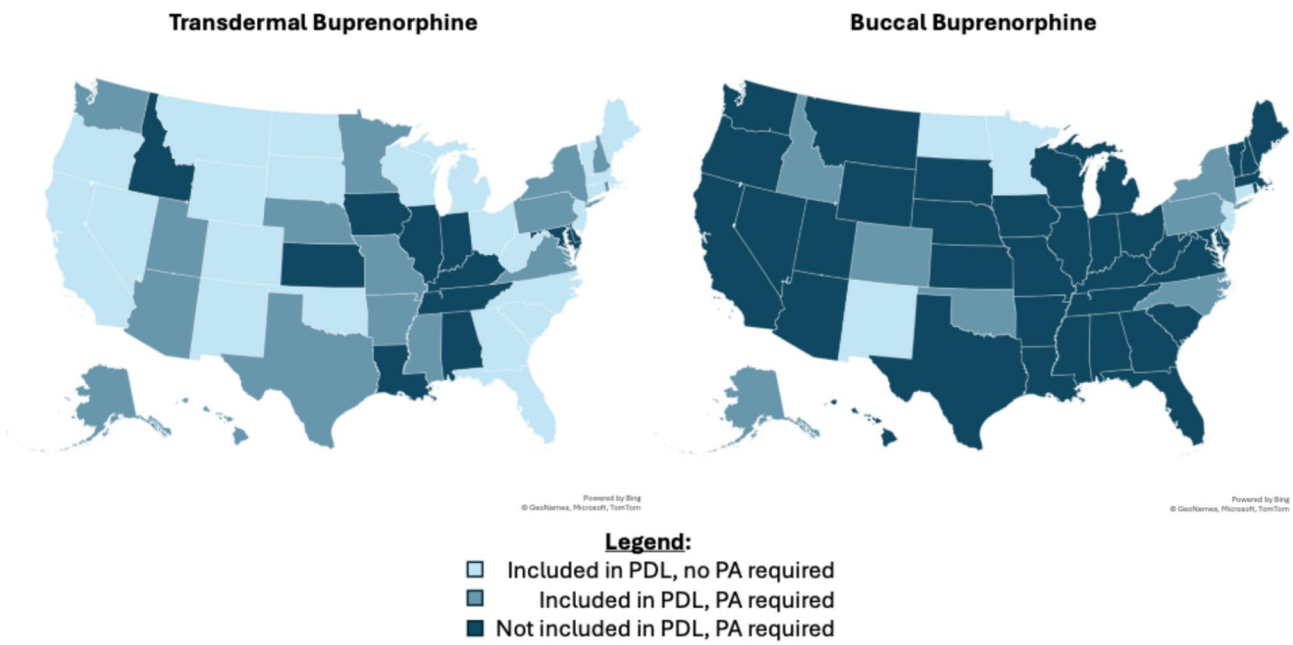

Figure 1 Geographic distribution of prior authorization and preferred drug list status of buprenorphine formulations that are FDA-approved for Pain. Legend: PDL: preferred drug list, PA: prior authorization.

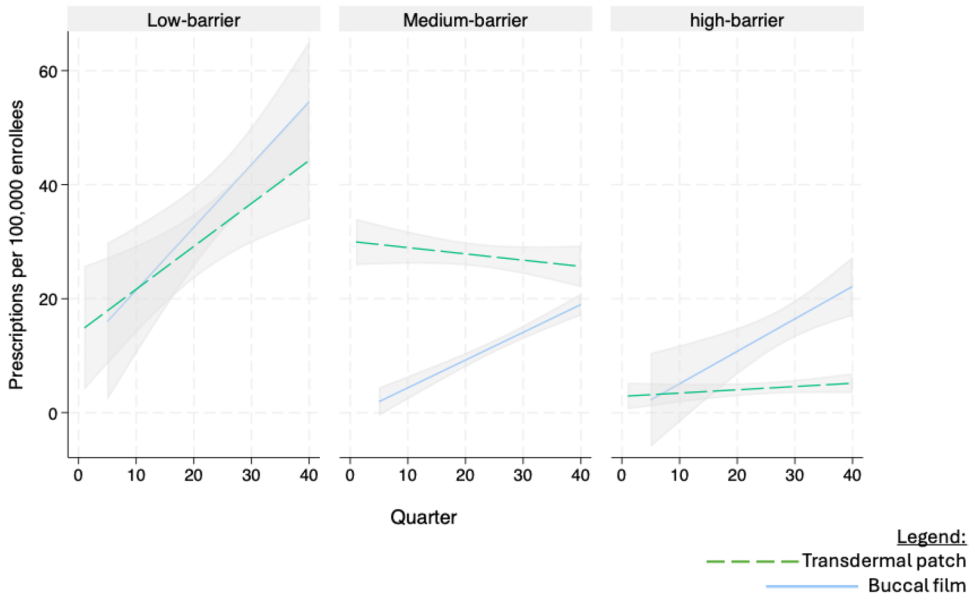

Figure 2 Trends in transdermal and buccal buprenorphine by barrier level. Legend: buccal buprenorphine use increased in all groups: low-barrier (β = 1.73, 95% CI 1.29–2.16), medium-barrier (β = 0.42, 95% CI 0.34–0.50), and high-barrier (β = 0.70, 95% CI 0.41–1.01). Transdermal patch use increased in low-barrier states (β = 0.72, 95% CI 0.30–1.14) but had no significant change in medium (β = −0.09, 95% CI −0.21;–0.04) or high-barrier states (β = 0.005, 95% CI −0.08, 0.09).

DISCUSSION

Our study has two findings. First, transdermal buprenorphine (vs. buccal) coverage is more common. Second, low-barrier policies are associated with increased use of both formulations. Cost may explain differences in coverage by formulation, given the lack of a generic buccal film. Buccal buprenorphine is available at higher doses than the patch, however, which may make it more desirable for achieving analgesia in some patients. Short-term cost-saving measures may undermine the longer-term benefits of adequate analgesia with buccal buprenorphine and its associated reduction in health care utilization and costs.[2] This is an ecological study that captures neither time variation in PA and PDL policies nor nuances in managed care vs fee-for-service Medicaid

policies. Future research should evaluate the *causal* impact of insurance-related barriers to buprenorphine use for pain on patient outcomes.

Acknowledgements *The authors would like to thank Dr. Carol Mangione for her feedback on this manuscript*

Author Contributions *MJNT participated in data collection, performed the analysis, and drafted the first draft of the manuscript.*
MA participated in data collection, weighed in on data interpretation, and edited the manuscript.
EPT weighed in on data interpretation and edited the manuscript.
All coauthors had full access to the data.

Funding *Dr. Nguemeni received support from the University of California, Los Angeles, RCMAR Center for Health Innovation and Maximizing Eldercare (CHIME) under NIH/NIA Grant P30-AG021684 and was also supported by NIH/NCATS UCLA CTSI Grant Number UL1TR001881. This project's contents are solely the responsibility of the authors and do not necessarily represent the official views of the NIH.*

Data Availability *Data will be available upon request.*

Declarations

Conflict of interest *None.*

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